

Claims

- [c1] 1. A method of treating a molybdenum (moly) mask used in a C4 process to pattern C4 contacts, comprising:
 - providing a moly mask used in the C4 process, the moly mask having a wafer side which contacts a wafer during the C4 process and which has a rough surface that includes projections of moly, a non wafer side, and a plurality of holes extending through the moly mask to pattern C4 contacts in the C4 process;
 - applying an adhesive layer to the non wafer side of the moly mask;
 - subjecting the non wafer side of the moly mask/adhesive layer to a vacuum;
 - polishing the wafer side of the moly mask with a polishing compound to substantially remove the projections of moly without significantly altering the dimensions of the moly mask or the holes.
- [c2] 2. The method of claim 1, further including cleaning the polishing compound from the moly mask/adhesive layer, and removing the adhesive layer from the moly mask.
- [c3] 3. The method of claim 1, wherein the step of applying includes applying an adhesive tape to the non wafer side

of the moly mask to enable a polishing tool to pull a vacuum on the non wafer side of the moly mask while the holes for patterning of the C4 contacts are present in the moly mask, and the tape also functioning as a cushion so that defects on the non wafer side of the moly mask do not replicate through the moly mask to the polished wafer side of the moly mask.

- [c4] 4. The method of claim 3, further including cleaning the polishing compound from the moly mask/adhesive tape, and removing the adhesive tape from the moly mask.
- [c5] 5. The method of claim 3, wherein the step of applying includes applying a UV deactivated tape to the non wafer side of the molybdenum mask.
- [c6] 6. The method of claim 5, further including cleaning the polishing compound from the moly mask/adhesive tape, exposing the moly mask/adhesive tape to a UV source to deactivate the UV tape, and then removing the UV tape.
- [c7] 7. The method of claim 3, wherein the step of applying includes applying an adhesive strip of pressure sensitive tape to the non wafer side of the moly mask.
- [c8] 8. The method of claim 1, wherein the step of polishing includes mechanical polishing of the wafer side of the moly mask to substantially remove the projections of

moly without significantly altering the dimensions of the moly mask or the holes.

- [c9] 9. The method of claim 8, wherein the step of polishing uses a polishing silica based slurry in potassium hydroxide having a pH at which the moly is stable to result in only mechanical polishing.
- [c10] 10. The method of claim 1, wherein the step of polishing includes chemical/mechanical polishing of the wafer side of the moly mask to substantially remove the spikes of moly without significantly altering the dimensions of the moly mask or the holes.
- [c11] 11. The method of claim 10, wherein the step of polishing uses a polishing silica based slurry having potassium hydroxide HNO₃ (nitric acid) to provide chemical/mechanical polishing.
- [c12] 12. The method of claim 1, wherein the step of polishing includes polishing with a polishing compound having abrasives with a hardness >5.5 on the Mohs scale.
- [c13] 13. The method of claim 12, wherein the step of polishing includes polishing with a polishing compound having an abrasive selected from the group of Al₂O₃, BaCO₃, and Cerium oxides.